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MAILSTOP: APPEAL BRIEF - PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Peter A. Hochstein
Appl. No. : 09/382,702
Filed : August 24, 1999
Title : POWER SUPPLY FOR LIGHT EMITTING DIODE ARRAY

Grp./A.U. : 2838
Examiner : B. Vu

Docket No. : 65,016-046

TRANSMITTAL OF APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

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Dear Sir:

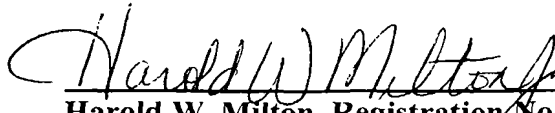
Applicant submits the attached Appeal Brief in response to the Official Action dated September 4, 2003. Additionally a Supplemental Reissue Application Declaration By The Inventor is also being submitted herewith, as requested by the Examiner.

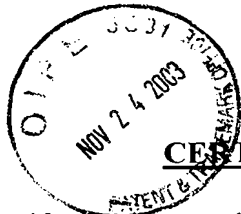
A check in the amount of \$330.00 is attached to cover the required fee for submitting this Appeal Brief. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 08-2789. A duplicate copy of this letter is enclosed herewith.

Respectfully submitted,

HOWARD & HOWARD ATTORNEYS, P.C.

11/20/03
Date


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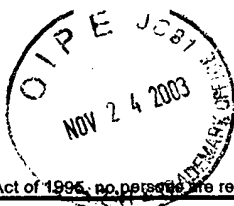
CERTIFICATE OF MAILING

I hereby certify that the attached Appeal Brief for application serial number **09/382,702** filed **August 24, 1999** is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the **Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450** on this **November 20, 2003.**

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**SUPPLEMENTAL REISSUE APPLICATION DECLARATION
BY THE INVENTOR**

Docket Number (Optional)

65,016-046

I hereby declare that:

Each inventor's residence, mailing address and citizenship are stated below next to their name.

I believe the inventors named below to be the original and first inventor(s) of the subject matter which is described and claimed in patent number 5,661,645, granted August 26, 1997 and for which a reissue patent is sought on the invention entitled POWER SUPPLY FOR LIGHT EMITTING DIODE ARRAY

the specification of which

☐ is attached hereto.

☒ was filed on August 24, 1999 as reissue application number 09/382,702
and was amended on June 7, 2000; October 12, 2000 and June 16, 2003.
(If applicable)

I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

☐ I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b). Attached is form PTO/SB/02B (or equivalent) listing the foreign applications.

I verily believe the original patent to be wholly or partly inoperative or invalid, for the reasons described below. (Check all boxes that apply.)

☐ by reason of a defective specification or drawing.

☒ by reason of the patentee claiming more or less than he had the right to claim in the patent.

☐ by reason of other errors.

At least one error upon which reissue is based is described below. If the reissue is a broadening reissue, such must be stated with an explanation as to the nature of the broadening:

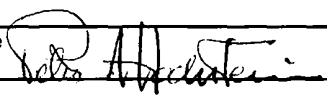
I now believe the original patent to be partly inoperative or invalid by reason that I claimed more or less than I had a right to claim in my original patent. As one example, my original patent included claims 5 and 6, where are dependent claims directed to an adaptive clamp/conflict monitor compatibility means for solving leakage current problems. During litigation on those claims, no defendant in my opinion developed prior art that anticipated or rendered obvious the substance of claims 5 or 6 standing alone. Therefore, I have added a claim, e.g., claim 44, directed to a conflict monitor compatibility circuit as an independent claim that is still distinct from and nonobvious over the most pertinent prior art, as set forth in the Exhibits D-G in the appeal brief filed herewith. At the time I filed my original patent application, I erred by not realizing that I was entitled to independent claims directed to a conflict monitor compatibility circuit that did not have limitations directed to a particular power supply structure.

[Page 1 of 2]

This collection of information is required by 37 CFR 1.175. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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(REISSUE APPLICATION DECLARATION BY THE INVENTOR, page 2)		Docket Number (Optional)	
		65,016-046	
All errors corrected in this reissue application arose without any deceptive intention on the part of the applicant.			
Note: To appoint a power of attorney, use form PTO/SB/81.			
Correspondence Address: Direct all communications about the application to:			
<input checked="" type="checkbox"/> Customer Number:		27305	
OR			
<input checked="" type="checkbox"/> Firm or Individual Name	Harold W. Milton, Jr. / Howard & Howard Attorneys, P.C.		
Address	The Pinehurst Office Center, Suite #101		
Address	39400 Woodward Avenue		
City	Bloomfield Hills	State	Michigan
		Zip	48304
Country	United States		
Telephone	(248) 723-0352	Fax	(248) 645-1568
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under 18 U.S.C. 1001, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this declaration is directed.			
Full name of sole or first inventor (given name, family name) Peter Anthony Hochstein			
Inventor's signature		Date	
Residence 2966 River Valley Drive		Citizenship United States	
Mailing Address Troy, Michigan 48098			
Full name of second joint inventor (given name, family name)			
Inventor's signature 		Date 11-19-03	
Residence		Citizenship	
Mailing Address			
Full name of third joint inventor (given name, family name)			
Inventor's signature		Date	
Residence		Citizenship	
Mailing Address			
<input type="checkbox"/> Additional joint inventors or legal representative(s) are named on separately numbered sheets forms PTO/SB/02A or 02LR attached hereto.			



Attorney Docket No.: 65,016-046

IN THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants:	Peter Hochstein)	
)	
Assignee:	Relume Corporation)	
)	
Serial No.:	09/382,702)	Group Art Unit: 2838
)	
Reissue Filed:	August 24, 1999)	Examiner: B. Vu
)	
Parent SN:	673,200)	
Parent Patent:	5,661,645)	
Parent Issued:	August 26, 1997)	
Parent Filed:	June 27, 1996)	
)	
)	
For:	Power Supply for Light Emitting Diode Array)	Docket No. 65,016-046
)	

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

APPEAL BRIEF

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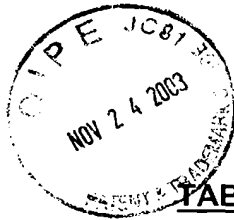


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BRIEF ON APPEAL

1. INTRODUCTION

This appeal is taken from the final rejection of Claims 24-35, 37, 38 and 40-45 in a reissue application for United States Patent No. 5,661,645 (Exhibit A). Previously, claims 1-2 and 4-6 of the original '645 patent were cancelled, as were new claims 36 and 39. The full text of each claim rejected on prior art is reproduced below in the body of this appeal brief, and in the appendix as Exhibit J.

The final rejection was made in an Office Action mailed September 4, 2003. (Exhibit B). A timely Notice of Appeal to the Board of Patent Appeals and Interferences was filed in this case on November 1, 2003 (Exhibit C). This Appeal Brief is timely filed on November __, 2003.

2. REAL PARTY IN INTEREST

The real party in interest is Relume Corporation.

3. RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to Appellant relevant to these proceedings.

4. STATUS OF CLAIMS

Claims 3, 7-35, 37, 38 and 40-45 were rejected in the final Office Action (Exhibit B). Of these, claims 3 and 7-23 were rejected solely on the basis of an alleged defect in the reissue oath, which has since been addressed.

Claims 24-35, 37, 38 and 40-45 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson (U.S. Patent No. 5,463,280) (Exhibit D) in view of

excerpts from the Power Supply Cookbook (Exhibit E) and the Motorola data sheet for the MC34261 controller (Exhibit F) in view of Applicant Prior Art (APA) (apparently, Figs. 1-3 of the '645 patent) and in view of Hildebrand (U.S. Patent No. 5,075,601) (Exhibit G).

5. STATUS OF AMENDMENTS

There were no amendments to the claims after the final rejection.

6. STATUS OF PROCEEDINGS AND SUMMARY OF INVENTION

A. Status of the Proceedings

This reissue application was filed on August 24, 1999, during patent infringement litigation over claims 1-2 and 4-6 of the original '645 patent. On September 7, 2000, the Examiner allowed the claims now under rejection. Then in February 2001, the Federal Circuit affirmed the invalidity judgement of the district court of claims 1-2 and 4-6. Because of this, on February 28, 2001, we filed a Petition to Withdraw from Issue, and on March 5, 2001, a Request for Continued Examination. The Petition was granted on March 21, 2001. Litigation is no longer pending.

As of the commencement of the continued examination in early 2001, the claims under examination were *different from* the claims that had been invalidated and were no longer being pursued. That is, claims 1-2 and 4-6 are not in this reissue application and not subject to examination hereunder. *Each* of the remaining claims contained additional, narrowing limitations that took them outside the scope of the court decision directed to claims 1-2 and 4-6. (See court decision, Exhibit H). Twenty-two months passed between the request for continued examination of the initially allowed claims and

the first rejection of those same claims.

The January 15, 2003 Office Action rejected claims 24-35, 37, 38 and 40-45 on art that had always been of record.

We traversed the January 2003 rejections in a paper filed June 16, 2003 (Exhibit I). The June paper explains why the Examiner must have misunderstood certain aspects of the technology in question.

The Examiner maintained the rejections in the September 4, 2003, final Office Action (Exhibit B). Although containing a section entitled "Response to Arguments," the final Office Action does not address, much less refute, any of the arguments in the June 2003 paper.

Had the Examiner given due credit to the statements of technological fact in the June 2003 paper, and corrected the various legal errors supporting the rejections, the Examiner would have been obligated to withdraw the rejections. This appeal followed.

B. Summary of the Invention

The '645 patent describes and claims novel circuitry for LED traffic signals. The circuitry was designed to solve at least three safety and environmental problems with existing LED traffic signals that had become apparent to the inventor, Mr. Hochstein:

- Poor power factor;
- Fluctuating LED light output resulting from line voltage fluctuations; and
- Leakage current from solid state controllers falsely triggering conflict monitors.

The patent solves the first of these problems by incorporating a power factor correcting switching power supply (a “switchmode converter”) between the input rectifier and the LED array. The use of a switchmode supply, in contrast to the prior art linear supplies, corrected for power factor because it increased the amount of time during each cycle of the a.c. input voltage when current flows through the LED load. The inferior prior art solutions known to Mr. Hochstein are depicted in Figures 1-3 of the ‘645 patent. None of these figures contains the critical feature of the invention — a switchmode power supply in an LED outdoor signal.

The use of the switchmode supply also solves the second of these problems: line input voltage fluctuations causing unstable light intensity. The switching nature of the supply efficiently stabilizes light intensity against fluctuations in input line voltage.

The patent solves the third of these problems through the use of a conflict monitor compatibility circuit. Traffic controllers (usually stationed in boxes on the side of the road near the intersection) were originally not designed to turn on and off LED lamps, but rather incandescent lamps. A safety feature of such traffic controllers is the “conflict monitor.” The conflict monitor changes the whole intersection to flashing red to prevent accidents if it senses there are crossing roads that each have a green light (such as might happen after a thunderstorm). Early LED traffic lamp installations falsely triggered such monitors. Mr. Hochstein figured out why — leakage currents from the solid state switch in the traffic controller created a high impedance condition upstream of the non-conducting (i.e., “turned-off”) LEDs. The conflict monitor sensed this high impedance and was “tricked” into “thinking” a turned-off lamp was actually turned-on —

exactly the “intersection conflict” that requires the intersection to go all-flashing-red. This was a new problem because, in the incandescent days, such leakage currents easily passed through the bulb filament and did not create the high impedance condition when a bulb was turned-off.

Mr. Hochstein’s solution was to design a circuit that shunts leakage current away from the LEDs when the signal is supposed to be turned off (in a plumbing analogy, like an overflow drain). Then, when the lamp is supposed to be turned on, the circuit removes itself (switches out) from the circuit to save power. Mr. Hochstein’s circuit of his preferred embodiment relies on a specific arrangement of a transistor configured as a switch (i.e., a digital switch) to bring in a low impedance shunt resistor when needed to detour leakage currents from the LED load (when the LEDs are supposed to be turned-off), and then to take out the low impedance shunt resistor when the LEDs are supposed to be turned-on. Removing the low impedance shunt when not needed saves power.

7. STATEMENT OF ISSUES

Did the Examiner err when he found a *prima facie* case for obviousness of the conflict monitor compatibility claims (40 and 44) even though the closest art of record (Hildebrand) discloses a negative impedance amplifier (by definition analog) which always dissipates power, not the switch-biased transistor (digital) limitations of the claims which forbid power dissipation when unneeded?

Did the Examiner err when he found a *prima facie* case for obviousness of the other claims (24-35, 37, 38, 41-43 and 45) in the absence of any evidence of a

teaching, suggestion or motivation to place LEDs driven by a switching power supply into an outdoor signal (such as a rail, traffic or pedestrian crossing signal)?

8. GROUPING OF CLAIMS

Group 1: Claims 24-27, 33-35 and 45 stand or fall together in the context of the applied art of record.

Group 2: Claims 28-32 contain an additional limitation beyond those in Group 1 and may be found patentable even if the Group 1 claims are not.

Group 3: Claims 37-38 and 41 are dependent claims and stand or fall with the claims from which they depend.

Group 4: Claims 42-43 are dependant claims which contain additional limitations beyond those in the claims from which they depend and may be found patentable even if their base claims are not.

Group 5: Claims 40 and 44 contain the conflict monitor compatibility limitations discussed above (claim 40 is dependant, claim 44 is independent), and stand or fall independently of the other claims on appeal.

9. ARGUMENT

We begin with the Group 5 claims, since these claims are directed to the unique conflict monitor compatibility circuit. These claims are patentable because the cited prior art works in the ***opposite*** manner from the limitations in the Group 5 claims.

Then we move onto the Groups 1-4 claims, where patentability hinges on the presence or absence of a motivation to combine various features of the prior art to “reconstruct” the inventions.

A. Group 5

i. The Claims Reproduced

The claims under rejection in Group 5 read as follows:

40. The assembly according to claims 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 further comprising a conflict monitor compatibility circuit, wherein the LEDs provide a high impedance condition in the presence of leakage currents, and the conflict monitor compatibility circuit includes:

- a transistor coupled to the LEDs and biased as a switch that switches from an essentially nonconductive condition in the absence of the high impedance condition to an essentially conductive condition in the presence of the high impedance condition; and

- a low impedance load in series connection with the transistor and in parallel connection with the LED load,

whereby leakage currents are shunted through the low impedance load, ensuring compatibility with conflict monitors designed for incandescent bulbs.

44. A conflict monitor compatibility circuit for use in traffic and pedestrian signaling applications, comprising:

- an LED load providing a high impedance condition in the presence of leakage currents from a solid state traffic controller switch;

- a transistor coupled to the LED load and biased as a switch that switches from an essentially nonconductive condition in the absence of the high impedance condition to an essentially conductive condition in the presence of the high impedance condition; and

- a low impedance load in series connection with the transistor and in parallel connection with the LED load,

whereby leakage currents are shunted through the low impedance load, ensuring compatibility with the conflict monitors designed for incandescent bulbs.

ii. **The Examiner Did Not Show *Prima Facie* Obviousness**

EXAMINER'S REJECTION: With respect to both claim 40 and 44, the Examiner states, "Hildebrand discloses that it is known in the art to provide the use of an adaptive clamp circuit used to help control leakage currents by providing high impedance if such conditions exist. It would have been obvious to . . . provide an adaptive clamp circuit as taught by Hildebrand, in order to lessen the effects of current leakage inherent to LED circuitry and have a more dynamic response to this recurring problem." (Exhibit B at 4).

This excerpt suggests the Examiner does not understand the problem solved by the Group 5 claims, or the nature of the claimed solution.

"Lessening the effects of current leakage inherent to LED circuitry" does not make sense in this context. Perhaps the Examiner does not realize that the source of the problem leakage currents addressed in this claim is the solid state traffic switch commonly at the side of the road, not the "LED circuitry" in the traffic signal.

"Controlling leakage currents by providing high impedance" also does not make sense. Leakage currents are not "controlled," but rather shunted away from the LED load in the claimed solution. And the claimed mechanism for doing this is a "low impedance load," not what the Examiner calls "providing high impedance."

REASONS WHY THE REJECTIONS SHOULD BE REVERSED: Hildebrand discloses neon and florescent bulbs, not LEDs. (Exhibit G, '601 Patent, 1:11-14, 1:20, 1:28, 4:50-53, 6:67). This alone is a distinction the Examiner failed to credit. He did not identify any suggestion in the prior art to place the Hildebrand negative impedance

amplifier into an LED lamp.

Several other limitations are absent from Hildebrand as follows, and not suggested in the Examiner's combination of prior art:

(1) The Examiner has not identified a particular transistor in Hildebrand coupled to LEDs (see discussion of the Group 1 claims, showing Hildebrand lacks LEDs).

(2) The Examiner has not identified a particular transistor in Hildebrand "biased as a switch." Hildebrand is crystal clear that its "dynamic load circuit" is an amplifier, (by definition analog) and thus necessarily lacks a transistor-switch (digital). (See 1:49-51: "a two stage inverting D.C. amplifier with a low impedance load and a defined offset voltage;" 6:17-50: "a grounded emitter high gain inverting stage," "closed loop gain of the amplifier," "amplifier output voltage.>"). It is a very important distinction, that the amplifier in Hildebrand is analog whereas applicant's transistor switch is digital.

(3) The Examiner has not identified the presence in Hildebrand of the claimed **functional** characteristics of the claimed transistor, even if one substituted Hildebrand's neon or fluorescent lamp for the claimed LEDs. Namely, the Hildebrand circuit does not become "essentially nonconductive" with the absence of a high impedance condition at its neon/fluorescent lamp. Put another way, the **claimed** functional condition **requires** essentially no power dissipation through the pertinent shunt resistor when the signal LEDs are turned on. In sharp contrast, since Hildebrand discloses a negative impedance amplifier (analog) rather than a transistor biased as a switch (digital), Fig. 4 of Hildebrand shows there is significant power dissipation at signal operating voltages,

80 to 135 VAC, particularly at the low end of the operating range. Hildebrand thus clearly lacks the functional limitation of an “essentially nonconductive condition in the absence of the high impedance condition.”

In sum, Hildebrand provides **a** solution for conflict monitor compatibility for neon or fluorescent lights, but not the **claimed** solution for LEDs, because Hildebrand works in the **opposite** way. The rejection of the Group 5 claims must be reversed for lack of any finding (or even evidence) that the combination suggests to one of ordinary skill in the art the claimed conflict monitor compatibility circuit.

B. Group 1

i. The Claims Reproduced

The claims under rejection in Group 1 read as follows:

24. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:
an electrical input for coupling to a source of a.c. line voltage;
a rectifier coupled to the electrical input and having a rectifier output;
a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output;
a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light;
an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and
a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

25. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:
an electrical input for coupling to a source of a.c. line voltage;
a rectifier coupled to the electrical input and having a rectifier output;

- a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output;

- a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

26. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;

- a rectifier coupled to the electrical input and having a rectifier output;

- a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output;

- an LED array having an input connected to the output of the power supply;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

27. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;

- a rectifier coupled to the electrical input and having a rectifier output;

- a line voltage regulating switchmode power supply having a power supply input coupled to the rectifier output and having a power supply output;

- a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

33. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;
- a rectifier coupled to the electrical input and having a rectifier output;

- a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;

- a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

34. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;

- a rectifier coupled to the electrical input and having a rectifier output;

- a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;

- a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

35. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;

- a rectifier coupled to the electrical input and having a rectifier output;

a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;

an LED array having an input connected to the output of the power supply;

an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

45. An apparatus for supplying power to an LED array in an outdoor line-connected signal comprising:

a rectifier (32) having an input and an output, said rectifier (32) being responsive to power at said input for generating rectified power at said output;

a power factor correction converter (38) having an input connected to said output of said rectifier (32) and an output, said power factor correction converter (38) being responsive to said rectified power at said power factor correction converter input for generating one of constant current and constant voltage at said power factor correction converter output;

an LED array (12) having an input connected to said output of said power factor correction converter (38) for receiving said one of said constant current and constant voltage to illuminate said LED array (12);

an electromagnetic interference filter means coupled to the power factor correction converter for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and

a traffic, pedestrian or rail crossing signal housing enclosing the rectifier (32), power factor correction converter (38) and LED array (12).

ii. **The Examiner Did Not Show *Prima Facie* Obviousness**

EXAMINER'S REJECTION: The Examiner states that the Group 1 claims are unpatentable for obviousness over Johnson, U.S. Patent No. 5,463,280, in view of the Power Supply Cookbook and the Motorola data sheet for the MC34261 controller in view of Applicant's Prior Art (APA) and in view of Hildebrand, United States Patent No. 5,075,601. The Examiner states this five-reference combination teaches the whole claim.

With respect to placement of LEDs with a switching power supply into an outdoor LED signal, the Examiner states the "Applicant's Prior Art (APA) in view of Hildebrand discloses that *it is known* in the art to make use of series-parallel LED array *in a switching power supply* and for their use *in traffic, pedestrian or rail crossing signal housing*." (Exhibit B at 3, emphasis added).

In the "Response to Arguments" section of the final Office Action, the Examiner attempted to justify combining from the prior art "a switching power supply with power factor correction for use with a LED array having an EMI filter" with "a series-parallel combination or used [sic] in traffic, pedestrian or rail crossing signal housing." (Exhibit B at 6). The Examiner correctly acknowledged this was something "the present combination does not teach," but went on anyway to hold the claim obvious.

REASONS WHY THE REJECTIONS SHOULD BE REVERSED: The Examiner misinterpreted the prior art shown in the '645 patent, Figures 1-3 (the "APA"), as well as the Hildebrand disclosure. Nowhere does the art show "it is known" to use a switching

power supply with a series-parallel LED array in a traffic, pedestrian or rail crossing signal. That teaching is provided exclusively by the inventor, in his '645 patent which is the subject of this reissue application. For instance, directly contrary to the Examiner's stated understanding, Figures 1-3 of the '645 patent show power supplies for series-parallel LED arrays, but they show outdoor signals that **lack any switching whatsoever**. As for Hildebrand, it discloses a pedestrian / traffic signal, but only for a "luminescent tubular lamps," which are fluorescent or neon. (Exhibit G, '601 Patent, 1:11-14, 1:20, 1:28, 4:50-53, 6:67). Thus, Hildebrand **lacks any LEDs whatsoever**. The only motivation to combine series-parallel LEDs and switching power supplies in a traffic, pedestrian or rail crossing signal comes from Peter Hochstein himself in his '645 patent.

Since the Examiner misunderstood the references, all of the rejections of the Group 1 claims must also be reversed for lack of findings supporting *prima facie* obviousness. See In re Robertson, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (clear error in anticipation finding eliminates sole basis for obviousness determination, "which therefore cannot stand.").

The Examiner seems to have addressed the non-relevant question of whether it would have been obvious to place a series-parallel LED array into an outdoor signal. Thus the Examiner mentions that "use of these LED arrays provides a greater benefit . . . and has the added feature of a more reliable operation of the LED array, this feature highly desirable for their use in traffic, pedestrian or rail crossing signals housing [sic]" (Exhibit B at 3), "since it provides a more reliable and efficiency [sic] of operation as

taught by APA” (Exhibit B at 6). This analysis drops the switching power supply out of consideration. Whether or not it would have been obvious to use series-parallel LED arrays in an outdoor signal, the Examiner has not shown or attempted to show it would have been obvious to place a series-parallel LED array ***driven by a switching power supply*** into ***an outdoor signal***. The alleged obviousness of the combination A-B does not speak to the patentability of the combination A-B-C.

The cited references together lack express disclosure or any suggestion of a switching power supply for LEDs in an outdoor signal — a limitation of all of the Group 1 claims. The Examiner cites no evidence that the combination teaches this limitation. The Examiner’s final Office Action (Exhibit B) seeks to justify his *prima facie* obviousness conclusions by citing In re Keller, 642 F.2d 413 (CCPA 1981) and In re Merck & Co., 800 F.2d 1091 (Fed. Cir. 1986), and explaining one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. But the Examiner miscites these cases. They merely hold one must ascertain what the combination teaches to one of ordinary skill in the art as of the time of the invention, something the Examiner has not done. The Examiner has ***not*** found (nor cited any evidence) that the combination teaches to place a switching power supply for LEDs into an outdoor signal.

The most the Examiner has done is (1) combine references to provide “a switching power supply with power factor correction for use with a LED array having an EMI filter” (Exhibit B at 6) and (2) combine ***different*** references to provide “a series-parallel combination or used [sic] in traffic, pedestrian or rain crossing signal housing.”

(Exhibit B at 6). This amounts to finding two subcombinations: A-B-C and D-E. Notice that each separate sub-combination **lacks** the crucial claim limitation: LEDs driven by a switching power supply in an outdoor signal. The Examiner identifies no teaching, suggestion or motivation to supply **this** limitation. Put another way, the separate presence of subcombinations A-B-C and D-E does not teach A-B-C-D-E.

Precedent requires "particular findings regarding the locus of the suggestion, teaching, or motivation to combine the prior art references." In re Dembiczak, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). Any showing of a motivation to combine must be "clear and particular" and cannot rely on broad, conclusory statements. Id. Mere assertions of "common knowledge" and "common sense" will not support an obviousness finding. In re Lee, 61 U.S.P.Q.2d 1430, 1430-32 (Fed. Cir. 2002) ("The need for specificity pervades this authority."). Here, the Examiner has not made any required finding, much less identified **evidence** which would support it. There is no evidence of a motivation to combine the stated subcombinations (A-B-C and D-E) from the perspective of one of ordinary skill in the art at the time of the invention. As the Federal Circuit held:

In addition to demonstrating the propriety of an obviousness analysis, particular factual findings regarding the suggestion, teaching, or motivation to combine serve a number of important purposes, including: (1) clear explication of the position adopted by the Examiner and the Board; (2) identification of the factual disputes, if any, between the applicant and the Board; and (3) facilitation of review on appeal.

In re Dembiczak, 50 U.S.P.Q.2d at 1617. The absence of particularized factual findings on the record here means that these "important purposes" are not satisfied. Further:

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.

W.L. Gore & Associates, Inc. v. Garlock, Inc., 220 U.S.P.Q. 303, 312-313 (Fed. Cir. 1983); Interconnect Planning Corp. v. Feil, 227 U.S.P.Q. 543, 547 (Fed. Cir. 1985) (When determining obviousness, "[t]he invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time."). The present rejections are a product of hindsight, not evidence.

In short, the only way the Examiner might have found that the combination of references teaches what Mr. Hochstein invented — driving LEDs with a switching power supply in an outdoor signal — is by falling victim to hindsight. The rejection of the Group 1 claims must be reversed for lack of any finding (or even evidence) that the combination suggests to one of ordinary skill in the art using a switching power supply to drive LEDs in an outdoor signal.

C. Group 2

i. The Claims Reproduced

The claims under rejection in Group 2 read as follows:

28. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:
an electrical input for coupling to a source of a.c. line voltage;
a rectifier coupled to the electrical input and having a rectifier output;
a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage;

- a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light;
- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and
- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

29. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;
- a rectifier coupled to the electrical input and having a rectifier output;
- a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage;

- a plurality of LEDs electrically configured such that the failure of a single LED results in continued emission of light from a substantial number of the rest of the plurality of LEDs;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and
- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

30. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:

- an electrical input for coupling to a source of a.c. line voltage;
- a rectifier coupled to the electrical input and having a rectifier output;

- a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage;

- a plurality of LEDs coupled to the output of the power supply in at least two current paths, whereby the cessation of current through one current path due to single point failure does not prevent current flow through another current path;

- an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and
- a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

31. A power supply assembly for powering light emitting diodes

(LEDs) in an outdoor line-connected signal, comprising:
an electrical input for coupling to a source of a.c. line voltage;
a rectifier coupled to the electrical input and having a rectifier output;
a switchmode power supply coupled to the output of the rectifier for maintaining current and voltage waveforms substantially in phase and for providing a regulated current output with respect to variations in the input line voltage;
an LED array having an input connected to the output of the power supply;
an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and
a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

32. A power supply assembly for powering light emitting diodes (LEDs) in an outdoor line-connected signal, comprising:
an electrical input for coupling to a source of a.c. line voltage;
a rectifier coupled to the electrical input and having a rectifier output;
a current regulating switchmode power supply coupled to the output of the rectifier for improving poor power factor, whereby the power supply provides essentially constant current at a power supply output with respect to variations in line voltage input, and whereby current and voltage waveforms are maintained substantially in phase;
a plurality of LEDs coupled to the power supply output and having multiple current paths for dissipating power and emitting light;
an electromagnetic interference filter means coupled to the power supply for preventing conducted interference from feeding back onto a.c. power lines connected to the electrical input; and
a traffic, pedestrian or rail crossing signal housing enclosing the assembly.

ii. The Examiner Did Not Show *Prima Facie* Obviousness

EXAMINER'S REJECTION: See discussion of the Group 1 claims, above.

REASONS WHY THE REJECTIONS SHOULD BE REVERSED: See discussion of the Group 1 claims, above.

As an additional basis for patentability, the Examiner has not pointed to, or attempted to point to, any motivation in the prior art to combine a ***traffic, rail or pedestrian outdoor signal*** with a power supply which “maintain[s] current and voltage waveforms substantially in phase and [] provid[es] a regulated current output with respect to variations in the input line voltage.” Peter Hochstein is the source of this teaching, not the prior art.

The Examiner states that maintaining current and voltage waveforms substantially in phase “is what power factor correction circuitry does,” but fails to address the other functional limitation of providing a regulated current output with respect to variations in input line voltage. Since the Examiner made no findings (and presented no evidence) that the prior art combination would have taught this claimed feature to one of ordinary skill in the art, this is an additional basis for reversal as to the Group 2 claims.

D. Group 3

i. The Claims Reproduced

The claims under rejection in Group 3 read as follows:

37. The assembly according to claims 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34 or 35 wherein the switchmode power supply comprises an integrated circuit power supply.

38. The assembly of claim 37 wherein the integrated circuit power supply comprises a power factor correcting switchmode converter integrated circuit.

41. The assembly according to claims 24, 25, 27, 28, 29, 30, 32, 33 or 34 wherein the plurality of LEDs comprise a plurality of series-parallel connected LEDs arranged in strings.

ii. The Examiner Did Not Show *Prima Facie* Obviousness

Patentability of the Group 3 claims stands or falls on the patentability of the Group 1 and Group 2 claims from which they depend.

E. Group 4

i. The Claims Reproduced

The claims under rejection in Group 4 read as follows:

42. The assembly according to claim 41 wherein the plurality of LEDs comprise a ballast resistor in each string.

43. The assembly according to claims 26, 31 or 35 wherein the LED array comprises a ballast resistor in each string of the array.

ii. The Examiner Did Not Show *Prima Facie* Obviousness

EXAMINER'S REJECTION: See discussion of the Group 1 and Group 2 claims, above.

REASONS WHY THE REJECTIONS SHOULD BE REVERSED: See discussion of the Group 1 and Group 2 claims, above.

As an additional basis for patentability, the Examiner has not pointed to, or attempted to point to, any motivation in the prior art to combine ballast resistors as claimed. Peter Hochstein is the source of this teaching, not the prior art.

Since the Examiner made no findings (and presented no evidence) that the prior art combination would have taught this claimed feature to one of ordinary skill in the art, this is an additional basis for reversal as to the Group 4 claims.

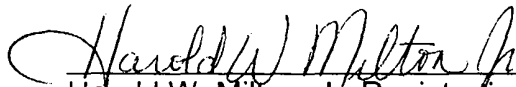
F. Conclusion

For the foregoing reasons, the Examiner's obviousness rejections should be reversed.

Respectfully submitted,

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